

Lassell's Satellite of Neptune. Observations by Mr. Lassell.

	Greenwich M.T.	Position.	Obs.	Distance.	Obs.	Power.
1849.	^h ^m	^o [']		^{''}		
Sept. 19	10 10 [·] 2	20 26	4			366
	10 25			8 [·] 86	1	—
Oct. 13	8 40	36 17	3			—
Nov. 3	8 16 [·] 4	218 6	4			—
	8 37 [·] 1			16 [·] 44	4	—

Sept. 19. Positions carefully taken, but with difficulty. The distance extremely difficult.
Oct. 13. Sky hazy.
Nov. 3. Sky indifferent, measures difficult; but, from the care employed and the advantage of a recently applied clock motion, considered to be equal in value to former measures taken in more favourable circumstances.

Goujon's Comet. Observations by Mr. Lassell.

	Greenwich M.T.	R.A.	N.P.D.	No. Obs.
1849.	^h ^m ^s	Star — Comet.	Star — Comet.	
Sept. 19	8 51 59 [·] 5	0 57 [·] 87	' "	9
	8 51 37 [·] 9		0 5 [·] 7	9
22	8 41 35 [·] 5	—0 33 [·] 54		7
	9 1 27 [·] 3		—2 28 [·] 2	9

“Since the above I have taken several favourable opportunities of looking for the comet, without success. Being situated, as it is, in so bright a portion of the Milky Way that the field was constantly filled with stars from the fifth magnitude downward, I scarcely expected that I should distinguish it. The field of the telescope was as bright as twilight.”

Mean Places for Jan. 1, 1849, of Stars compared by Mr. Lassell with Goujon's Comet.

LIVERPOOL.		Equatoreal.	(Mr. Hartnup.)
Day of Comp.	Mag.	Mean R.A.	Mean N.P.D. No. Obs.
with Comet.			Stars on which these
1849.		^h ^m ^s	Places depend.
Sept. 11	6	18 9 8 [·] 19	B.A.C.
17	8 ¹ / ₂	28 41 [·] 15	6079, 6289, 6500
19	8 ¹ / ₂	35 13 [·] 56	
22	8 ¹ / ₂	18 43 4 [·] 58	
		33 25 32 [·] 4	

Observations of Gambart's (Biela's) Comet. By T. Maclear, Esq.
Her Majesty's Astronomer at the Cape of Good Hope.

“The observations of this comet were made with the 46-inch achromatic by Dollond, mounted on its old equatoreal stand, and armed with a position-micrometer, by Simms, having three flat wires instead of spider-lines. Two of these wires are parallel and moveable by micrometer screws, one revolution of which is equal to 44^{''}.5315 of a great circle. The third is fixed and perpendicular to the moveable wires. The breadth of each wire is about 19^{''}.
“The moveable wires were adjusted parallel to the equator by causing stars near the equator to describe a narrow space between their proximate edges.

“No artificial light was used in observation, except for the purpose of counting the revolutions: this was managed by rotating the small illuminating reflector on the axis of its support.

“The telescope being clamped, the differences in right ascension were the differences in time between the disappearances behind the fixed wire, corrected for the rate of the chronometer; and the apparent differences in declination were measured by placing one or other of the edges of one moveable wire on the apparent centre of the star, and the centre of the other moveable wire on the centre of the comet. The edges were placed on the centre of the star in alternate order, generally, to eliminate the breadth of the wire. When time and distance permitted, both objects were measured by the same screw, and in all cases, as near as possible to the fixed wire.

“This comet is perhaps the most interesting on record, on account of the appendage, which was probably a portion of the original mass. The observations of the appendage are distinguished by the letter *a*. After the 25th of February this body was compared occasionally with the principal mass. These comparisons are given by themselves; they are somewhat uncertain because there was no obvious centre to select for the wire, and the outline was very faint. After the 18th of March no measures of it were attempted.

“The heading to each column is sufficiently explicit. The numbers in the columns, R.A., N.P.D., express *geocentric* positions; viz. the observed positions corrected for parallax and refraction. For the computation of parallax the distances stated in the *Nautical Almanac* for 1849, page xvi. &c. were employed.

“The last column gives the initials of the observer. W. M. denotes William Mann; H. C., Hubert Campion, R.N.; T. M., Thomas Maclear.

“A Catalogue is added containing the positions of the stars compared with the comet, all of which, excepting two, were determined by the 10-feet transit instrument and 6-feet mural circle. Nos. 14 and 15 were observed with the 46-inch equatoreal instrument, erected in the year 1847, by the method of differences. The star is identified by its number. The positions are the mean places January 1, 1846, and the precessions refer to the same epoch.*

Date.	No.	Cape M.T.	R.A.	N.P.D.	Obs.
1846.		^h ^m ^s	^h ^m ^s	"	
Feb. 18 (a)	1	8 40 34.3	2 12 52.98		6 W. M.
	...	40 44.8	13 3.54		6
(a)	...	55 2.7		95 15 21.6	4
	...	58 38.0		20 43.3	4
19 (a)	2	27 6.9	2 17 58.02		6 W. M.
	...	27 17.6	18 8.80		6
	...	43 1.5		95 36 5.1	4
(a)	...	8 43 34.4		30 32.4	10

* Mr. Maclear has sent his observations in fuller detail than they are given here; all the *results* are published, and in case of doubt the original papers can easily be referred to.

10 *Observations of Gambart's (Biela's) Comet.*

Date.	No.	Cape	M.T.	R.A.	N.P.D.	Obs.						
1846.		h	m	s	h	m	s	o	'	"		
Feb. 19	(a) 2	9	5	22.2	2	18	6.12				4	W. M.
	...	9	5	33.1		18	17.15				4	
20	(a) 3	8	7	23.5	2	23	7.72				6	W. M.
	...		7	34.4		23	18.64				6	
	(a) ...	21	44.2					95	45	59.1	6	
	...	24	51.2					51	43.3		6	
25	(a) 4		35	3.8	2	51	1.81				8	H. C.
	...	8	35	19.2		51	17.30				8	
	(a) ..	9	13	41.6				97	11	15.4	8	
	...	9	18	20.0				18	33.9		8	
26	5	8	38	30.4	2	57	14.99				8	H. C.
	...	8	59	16.8				97	36	3.4	8	
	...	9	16	15.6		57	24.50				8	
Mar. 1	6		50	13.0	3	16	14.25				3	T. M.
	...	9	50	16.3				98	32	40.0	3	
4	10	8	21	59.6	3	35	47.50	99	29	40.0	3	T. M.
	9	8	23	26.1		35	48.03		29	40.7	4	
	9	9	14	47.3		36	2.28		30	26.4	6	
	10	9	14	47.3		36	1.77		30	22.0	6	
	9	10	10	54.6		36	17.60		31	1.1	2	
	10	10	10	54.6		36	17.81		30	58.0	2	
5	11	8	56	4.5	3	42	53.54				2	T. M.
	12	8	56	4.5		42	53.79				2	
	14	8	56	4.5		42	54.71				2	
	11	9	14	23.4		42	57.44				2	
	12	9	14	23.4		42	56.75				2	
	14	9	43	7.3		43	6.74	99	49	45.3	8	
	14	10	10	8.7		43	14.85		50	20.9	2	
	15	10	10	8.7		43	14.10		50	28.0	2	
6	16	7	52	46.1	3	49	41.98	100	8	6.8	6	T. M.
	17	8	26	50.0					8	48.1	10	
	...	9	19	44.9		50	6.07				15	
	...		42	59.0					9	34.9	5	
	...		43	50.1		50	12.98				11	
	...	9	49	29.1					9	43.8	4	
	...	10	16	29.6					9	43.3	6	
	...		17	6.9		50	22.72				11	
	...	10	31	29.9					9	53.6	2	
Mar. 7	18	7	52	11.0	3	56	54.85				4	T. M.
	19	7	53	36.6		56	54.55				5	
	...	8	24	9.8				100	27	35.9	12	
	...	8	32	25.2		57	6.97				9	
	18	9	45	15.5		57	32.42				4	
	19	9	55	7.0	3	57	32.20	100	28	58.2	8	

Date.	No.	Cape M.T.	R.A.	N.P.D.	Obs.	
1846.		h m s	h m s	° ' "		
Mar. 8	20	7 59 25.3	4 4 19.20	100 46 43.7	6	T. M.
	...	8 36 6.9	4 30.81	47 5.1	8	
	21	8 36 6.9	4 30.96	47 5.2	8	
	20	9 15 23.8	4 43.94	47 42.3	10	
	21	15 23.8	4 43.97	47 36.8		10
	20	50 43.9	4 54.15	47 54.3	6	
	21	9 50 50.2	4 55.13	46 56.5	4	
	20	10 21 1.1	5 3.35		10	
	20	10 42 48.0		48 38.0	4	
9	22	7 41 59.0	4 11 47.18		5	T. M.
	...	7 54 12.5		101 6 36.5	6	
	...	8 10 3.8	11 56.15		6	
	...	46 42.4		6 57.5	6	
	...	8 58 5.4	12 11.82		6	
	...	9 11 6.6		7 15.1	6	
	...	30 11.9	12 22.32		6	
	...	43 34.3		7 46.7	6	
	...	9 57 22.4	12 31.11		6	
10	23	8 10 40.1	4 19 39.73		6	T. M.
	24	10 40.1	19 39.18		6	
	23	42 33.8	19 49.10	101 24 41.9	8	
	24	8 48 30.0	19 50.31	24 40.7	6	
	23	9 29 9.7	20 3.02		9	
	24	29 9.7	20 2.81		9	
	23	31 11.5		25 19.2	8	
	24	9 31 11.5		25 20.4	8	
	24	10 24 44.9	20 20.07	25 55.1	8	
11	25	8 18 18.2	4 27 30.16		14	T. M.
	...	8 21 50.7	27 31.47	101 42 28.2	12	
	...	9 5 5.6	27 46.19	43 3.0	10	
	26	10 1 54.0	28 4.35	43 49.8	10	
	25	10 35 35.5		44 14.3	2	
12	27	8 13 4.9	4 35 27.51		6	T. M.
	...	33 17.7		102 0 24.6	8	
	...	8 34 26.4	35 34.03		10	
	...	9 27 41.8	35 51.82	1 2.8	12	
	...	10 1 39.2	36 3.34	1 30.3	6	
13	28	8 0 58.6	4 43 29.02	102 17 3.2	12	T. M.
	29	0 58.6	43 28.72	17 4.2	12	
	28	52 24.4	43 46.56	17 40.0	10	
	29	8 52 24.4	43 46.32	17 41.2	10	
	28	9 35 32.4	44 0.87	18 7.9	10	
	29	9 35 32.4	44 0.60	18 8.8	10	
Mar. 14	30	8 40 38.1	4 51 54.56	102 34 6.0	8	H. C.

Observations of Gambart's (Biela's) Comet.

Date. 1846.	No.	Cape M.T. h m s	R.A. h m s	N.P.D. ° ' "	Obs.
Mar. 14	30	9 8 55.8	4 52 5.20	102 34 17.7	8
	...	9 47 36.5	52 18.27	34 38.8	8
15	32	7 52 4.2		102 48 28.6	2 T. M.
	...	7 52 7.3	4 59 58.98		3
	...	8 24 38.0	5 0 11.15	48 57.0	4
	...	8 59 3.1	0 22.06		6
	31	9 1 19.8	0 22.84		4
	31	8 20.9	0 26.40		3
	32	8 20.9	0 26.17		3
	...	27 56.5		50 0.0	8
	...	39 35.0	0 36.64		6
	...	47 31.8		50 18.7	6
	...	9 55 58.7	0 42.22		5
17	33	8 8 3.8	5 17 2.34		6 T. M.
	...	11 38.6		103 17 55.2	4
	λ	30 25.7	17 10.26	17 58.1	2
	...	8 30 25.7	17 10.59	18 0.0	2
	...	9 0 58.4	17 21.17	18 23.0	12
	...	9 42 16.6	17 35.92	18 37.0	12
	...	10 13 34.0	17 46.74	18 58.3	9
18	34	7 49 10.6	5 25 31.64		6 T. M.
	...	7 58 59.7		103 30 35.3	6
	...	8 10 48.1	25 39.35		4
	...	8 35 27.6	25 47.70	30 55.1	8
	36	8 35 27.6	25 47.69	30 51.9	8
	...	9 15 3.8	26 2.59	31 12.8	10
	35	9 45 47.2	26 13.13	31 25.8	10
	36	10 7 35.1	26 21.25	31 39.6	6
19	37	7 42 45.2	5 34 9.28	103 42 15.0	12 T. M.
	...	8 22 5.7	34 23.37	42 29.6	8
	...	9 41 42.9	34 52.29	43 8.9	10
20	38	8 32 16.9	5 43 10.01	103 53 25.4	10 H. C.
	39	8 32 16.9	43 10.10	53 17.2	10
	38	9 43 38.9	43 35.05	53 50.9	10
	39	9 43 38.9	43 35.18	53 48.8	10
21	40	8 20 26.1	5 51 50.35	104 2 44.3	6 T. M.
	41	42 8.8		2 49.0	4
	41	8 48 23.0	52 1.34		4
	42	9 7 14.9	52 7.40	2 56.5	4
	41	38 3.5	52 18.64	3 8.1	10
	42	9 38 3.5	52 18.75	3 7.4	10
	41	10 22 41.5	52 34.63	3 26.8	10
	42	10 22 41.5	5 52 34.52	3 29.0	10
Mar. 23	43	8 9 4.8	6 9 16.02	104 18 5.6	4 T. M.

Date.	No.	Cape M.T.	R.A.	N.P.D.	Obs.	
1846.		^h _h ^m _m ^s _s	^h _h ^m _m ^s _s	^o _o ['] _' ["] _"		
Mar. 23	44	8 9 4.8	6 9 16.35	104 18 8.3	4	T. M.
	43	8 29 5.3	9 24.03	18 3.2	2	
	43	9 6 53.3	9 37.80	18 20.6	12	
	44	9 6 53.3	9 37.62	18 19.9	12	
	43	10 8 59.8	9 59.03	18 35.8	12	
	44	10 8 59.8	9 59.28	18 36.0	12	
24	45	8 38 2.7	6 18 10.21		5	T. M.
	46	38 2.7	18 10.31		5	
	46	49 21.6		104 23 52.8	4	
	45	8 55 59.2		23 48.3	4	
	45	9 20 26.3	18 27.05		6	
	45	23 20.9		23 56.9	4	
	46	9 37 3.5	18 33.07	24 5.7	4	
	45	10 6 10.0	18 43.43	24 5.3	4	
	45	33 24.5	18 53.39	24 22.2	6	
	46	10 53 23.9	19 0.04	24 17.1	6	
26	46 bis	8 30 57.4	6 35 28.79		4	H. C.
	...	48 3.0			12	
	...	8 59 53.7	35 38.72		13	
	...	9 14 20.8			2	
	...	9 33 12.8	35 51.32		10	
27	47	8 14 57.5	6 43 58.68		10	T. M.
	...	8 30 26.8		104 33 50.0	10	
	...	9 6 21.9	44 16.30		10	
	...	9 35 13.5		33 45.0	10	
	...	10 13 2.4	44 40.84	33 56.4	10	
	48	10 13 2.4	44 41.16	34 0.1	10	
28	49	8 2 5.7	6 51 22.80	104 34 47.8	4	H. C.
	49	9 14 12.2		34 53.7	8	
	49	16 57.3	52 50.01		10	
	50	22 38.8		34 52.0	6	
	50	9 25 16.0	52 52.21		7	
	49	10 25 45.6	53 12.75	34 52.9	10	
	50	10 25 45.6	53 12.01	34 41.2	10	
29	51	8 55 48.0	7 1 5.11	104 34 35.7	10	T. M.
	52	8 55 48.0	1 5.07	34 38.0	10	
	51	10 8 8.2	1 27.92	34 38.4	8	
	52	10 8 8.2	1 28.09	34 45.5	8	
Mar. 31	54	8 36 20.2	7 17 23.40	104 31 9.8	8	T. M.
	54	9 15 58.1	17 37.34	31 2.6	6	
	53	32 39.8	17 44.32		2	
	54	32 39.8	17 44.46		2	
	53	37 38.2	17 44.47		3	
	54	37 38.2	17 44.56		3	

14 Observations of Gambart's (Biela's) Comet.

Date. 1846.	No.	Cape M.T. h m s	R.A. h m s	N.P.D. ° ' "	Obs.	
Mar. 31	53	9 51 53.9		104 30 54.4	8	T.M.
	54	10 6 8.2		31 4.0	8	
	53	18 33.0	7 17 57.78		6	
	54	18 33.0	17 57.41		6	
	54	10 31 21.4		30 55.3	5	
April 2	55	8 2 49.1	7 33 3.69		4	T. M.
	...	8 59 13.5	33 24.83		11	
	...	9 24 18.9		104 23 46.0	6	
	...	9 37 23.6	33 38.19		7	
3	56	7 48 53.6	7 40 43.73		4	T. M.
	57	7 48 53.6	40 43.78		4	
	56	8 9 51.4		104 19 50.9	2	
	57	9 51.4		19 50.2	2	
	56	19 49.0	40 54.40		5	
	57	19 49.0	40 54.67		5	
	56	43 15.2	41 1.93		2	
	57	43 15.2	41 2.35		2	
	56	53 51.6	41 6.76		8	
	57	8 53 51.6	41 7.13		8	
	56	9 19 2.0	41 14.63	18 36.6	2	
	57	9 19 2.0	7 41 15.06	104 18 36.1	2	

Differences in Right Ascension and North Polar Distance of the two Comets. The smaller one precedes, and is to the north of the larger.

Date.	Obs.	Cape M.T. h m s	Diff. R.A. s	Diff. N.P.D. ' "
Feb. 26	6	9 23 48.4	15.40	
	8	9 31 4.3		6 53.2
Mar. 3	2	7 48 11.7	17.55	7 39.7
	5	7 49 50.3	23.31	7 20.5
	17	7 44 23.0	40.37	
	3	7 51 43.2		9 8.0
	18	7 33 4.1	36.43	
	2	7 37 17.9		8 52.1

Mean Places of the Stars, for January 1, 1846, compared with Gambart's (Biela's) Comet.

No.	Mag.	R.A. h m s	Ann. Prec. s	Obs.	N.P.D. ° ' "	Ann. Prec. "	Obs.
1	7	2 11 56.71	+3.006	4	95 3 25.3	-16.82	4
2	9	17 24.21	2.999	4	26 49.0	16.55	5
3	9	22 44.72	2.992	5	43 7.7	16.28	5
4	8	51 55.74	2.955	4	97 13 51.9	14.67	4
5	10	2 56 48.03	2.948	4	97 28 1.0	14.37	3
6	8	3 15 46.53	2.923	6	98 20 14.3	13.17	9
7	8	29 17.86	2.898	4	99 17 6.7	12.25	3
8		31 54.73	2.901	1	0 47.8	12.07	2
9	8	3 32 44.14	+2.891	5	99 32 30.6	-12.01	2

Observations of Gambart's (Biela's) Comet.

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No.	Mag.	R.A.			Ann. Pre.	Obs.	N.P.D.			Ann. Pre.	Obs.
		^h	^m	^s	^s		[°]	[']	["]	["]	
10	7½	3	38	31.39	+2.888	7	99	29	36.2	-11.60	10
11	8½		39	12.15	2.879	6		55	29.3	11.56	4
12	8½		39	26.60	2.880	4		52	4.3	11.54	3
14	10		42	53.59	2.881			43	6.7	11.29	
15	7		46	29.32	2.879		99	42	52.4	11.03	
16	6		49	14.89	2.868	8	100	12	8.8	10.83	5
17	8		50	15.60	2.869	5		8	54.5	10.75	5
18	10		56	53.92	2.858	4		27	23.7	10.25	1
19	7	3	59	40.87	2.858	14		24	43.5	10.05	6
20	9	4	4	50.96	2.846	6		51	55.5	9.65	5
21	7		6	10.45	2.847	7		46	56.7	9.55	7
22	8½		12	15.94	2.840	9	100	58	11.5	9.08	6
23	9		18	43.97	2.824	5	101	31	27.4	8.57	6
24	7		20	31.76	2.824	9		28	23.6	8.43	5
25	8½		28	13.44	2.811	6		53	40.0	7.81	4
26	7½		29	9.52	2.818	4	101	35	4.5	7.74	5
27	8½		34	36.95	2.806	7	102	0	38.3	7.29	5
28	8		42	30.43	2.795	6		18	53.1	6.65	7
29	7½		44	30.33	2.797	7		12	45.6	6.48	7
30	6	4	52	46.48	2.780	10		46	7.5	5.79	10
31	7	5	0	14.93	2.780	11		41	41.9	5.16	6
32	7		0	41.78	2.777	7	102	47	43.0	5.13	5
Leporis λ	7½		12	28.87	2.760	5	103	20	25.3	4.12	2
33	7½		18	33.59	2.760	12		16	13.9	3.60	7
34	9		25	16.25	2.757	5		20	15.9	2.02	6
35	8½		26	35.89	2.749	4		38	37.6	2.91	5
36	9		26	51.16	2.755	5		24	1.8	2.88	6
37	8		33	42.00	2.745	7		46	3.9	2.29	5
38	9		41	26.47	2.745	7		42	36.9	1.62	6
39	8		44	32.65	2.742	4	103	50	51.0	1.35	4
40	8		50	45.75	2.732	9	104	13	52.3	0.80	6
41	8½		51	49.17	2.732	6		13	26.2	0.71	5
42	9	5	53	20.26	2.737	5		1	40.9	-0.58	5
43	8	6	8	56.40	2.728	10		22	54.1	+0.79	5
44	8		11	34.97	2.730	5		18	13.6	1.02	5
45	7½		18	1.29	2.728	11		25	20.6	1.58	5
46	7½		18	10.27	2.730	3		20	2.8	1.59	5
46 bis	8		34	47.43	2.730	7					
47	8		43	46.44	2.729	8		33	56.7	3.81	5
48	8½		46	29.82	2.734	6		25	4.1	4.05	3
49	8½		51	0.63	2.730	7		37	4.7	4.43	5
50	7½		52	2.04	2.727	7		45	20.8	4.52	5
51	8	6	58	32.07	2.732	7		38	32.2	5.07	5
52	8	7	3	20.06	2.737	7		31	12.1	5.48	5
53	8½		17	4.73	2.745	9		26	35.9	6.63	5
54	8		18	4.49	2.743	5		35	4.2	6.71	7
55	8½		33	28.14	2.758	6		17	29.5	7.96	5
56	8½		40	21.21	2.759	8		24	27.4	8.51	5
57	8½	7	41	54.68	+2.764	4	104	14	0.6	+8.63	4